AF/1745

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	:	**Confirmation No. 1381**
Giovanni Pietro CHIAVAROTTI et al.	:	Docket No. 2000-1545
Serial No.09/707,885	:	Group Art Unit 1745
Filed November 8, 2000	:	Examiner M. Ruthkosky
PROCESS FOR PRODUCING AN ELECTRODE AND USE OF THE ELECTRODE	:	

REPLY BRIEF

THE COMMISSIONER IS AUTHORIZED TO CHARGE ANY DEFICIENCY IN THE FEE FOR THIS PAPER TO DEPOSIT ACCOUNT NO. 23-0975.

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in reply to the Examiner's Answer mailed September 12, 2003.

UPDATE ON RELATED APPEALS AND INTERFERENCES

At the time Appellants' Brief was filed on June 30, 2003, there were no related appeals or interferences, as indicated in the Brief. However, in connection with related application Serial No. 10/164,570 (see the first full paragraph on page 2 of Appellant's Brief in the present application), a Notice of Appeal was filed on August 20, 2003, followed by the filing of Appellants' Brief on October 20, 2003.

REPLY TO EXAMINER'S ANSWER

In the last paragraph on page 3 of the Examiner's Answer, after discussing the Yamada et al. reference, the Examiner states that:

"An equivalent method is provided in the instant application to prepare an impermeable or substantially impermeable conductive layer of graphite on the substrate. As the methods are equivalent, the graphite layer of the prior art reference must also inherently be impermeable or substantially impermeable." (Emphasis added)

Similarly, in the Response to Argument section beginning on page 4 of the Examiner's Answer, the Examiner states that:

"The examiner has taken the position that the methods of producing the electrodes are the same or similar as between the instant invention ad the prior art reference of Yamada et al. and that the product of the reference must also be impermeable or substantially impermeable." (Emphasis added)

However, as discussed at length in Appellants' Brief, claims to the process for producing the impermeable or substantially impermeable electrode of the claims on appeal in the present application were allowed in the parent application (now USP 6,428,842, a copy of which was attached to Appellants' Brief), after considerable discussion about the same Yamada et al. reference now relied upon by the Examiner to reject the claims on appeal in the present application. [The wording of claim 1 of the parent '842 patent is very close to the wording of the description of the process for producing the electrode as set forth in the paragraph bridging pages 1 and 2 of the present application.] How could the process of the present application be "equivalent", or "the same or similar" to the Yamada et al. process if a patent was issued for the process of the present application after thorough discussion of the Yamada et al. reference? The issuance of the parent patent on the process for producing the electrode is the antithesis of being equivalent to, or the same or similar as the process disclosed by Yamada et al.

In the last paragraph on page 4 of the Examiner's Answer, the Examiner takes the position that Appellants' arguments with respect to the parent application are moot as the claimed subject matter is different, and that although the claimed process of the parent application was considered patentable, Appellants have not shown that the process of the prior art reference does not form an impermeable or substantially impermeable graphite layer on a substrate. This argument is repeated several times throughout the Examiner's Answer, in the first sentence on page 5, the first sentence on page 6, and in the paragraph beginning at the middle of page 6 of the Examiner's Answer.

However, the basis on which the Examiner concludes that the graphite layer of Yamada et al. must inherently be impermeable or substantially impermeable, is that the method provided in the instant application is equivalent (or the same or similar) to the method of Yamada (last sentence on page 3 of the Examiner's Answer as quoted above). The fact that a patent was issued on the parent application for the process directly contradicts this argument of equivalency, and therefore is not "moot" as the Examiner asserts, but rather is germane to the issue of patentability over Yamada et al.

Referring again to the last sentence on page 3 of the Examiner's Answer, wherein the Examiner states that the graphite layer of Yamada et al. must also inherently be impermeable or substantially impermeable, this issue of inherency is addressed in MPEP §§2112 and 2112.01, which squarely places the burden of proof on the Examiner to establish inherency. According to this section of the Manual, a rejection based on inherent disclosure of a reference leading to a shift of the burden of proof from the PTO to the applicant is only admissible if the Examiner presents evidence that a certain feature is necessarily disclosed in the prior art. There are strict demands on this requirement of providing evidence. Thus it is not sufficient for the Examiner to show that a certain material property

> "may occur or be present in the prior art",

but it is necessary to

> "provide a basis in fact and/or a technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied art" (Emphasis added) (MPEP §2112, page 2100-52, left column, last paragraph in connection with same page, right column, second paragraph, first sentence).

Consequently, before the burden of proof with regard to the permeability/impermeability of the electrodes taught by Yamada et al. shifts to Appellants, the Examiner must present strong technical reasoning that both processes, namely those described by Yamada et al. and in the present application, are identical or at least substantially identical so that the products of both processes necessarily possess the same properties. A mere similarity of the processes is not sufficient. This prerequisite to a shift in the burden of proof has not been satisfied by the Examiner.

The fact alone, that a US patent was granted on the parent application for the process described in the present application after considering the reference of Yamada et al. demonstrates that both processes are neither identical nor substantially identical. It is simply not possible that process A is new and inventive with respect to process B, but nevertheless process B is the same or similar to process A.

Consequently, the Examiner still has the burden of proving lack of novelty, and his thereto related statement, that

> "*although the claimed process of the parent application was considered patentable, the applicant has not shown that the process of the prior art reference does not form an impermeable or substantially impermeable layer of graphite*" (page 4, last paragraph of the Examiner's Answer)

is legally unsound.

Apart from this, the Examiner's arguments allegedly supporting that both processes are *"equivalent" or "similar"* are not convincing, as discussed in Appellants' Brief and below.

a) First of all, the process disclosed by Yamada et al. differs from that described in the present application in that Yamada et al. suggest to use a porous substrate - e.g. in form of a mesh or fiber - as starting material with a porosity of 60 to 95 % in order to increase the current collecting effect (column 4, lines 52-57; Examples 10 to 12; claim 5). As clearly shown in Figure 2 the pores are not limited to the surface of the substrate but reach straight through the substrate.

As mentioned in column 10, lines 31 and 32 of Yamada et al., the graphite particles diffuse into the pores. However, since diffusion in pores *per se* is a very slow process in particular when a solid such as graphite is concerned, these particles definitively do not cover the whole surface of the pores extending straight across the substrate, but merely cover a minor part of it. The surface tension of the mixture containing graphite particles, which is applied to the substrate, prevents the mixture from entering deeply into the pores. Thus, it is simply impossible that the whole pore surface is covered by graphite particles as stated by the Examiner on page 7, lines 3 to 4 of the Examiner's Answer. Furthermore, it is impossible that the graphite particles lock the pores itself, since they are smaller than the pores.

Consequently, these electrodes of Yamada et al. are coated with a permeable layer, and the process disclosed by Yamada et al. will not necessarily lead to electrodes with an impermeable or substantially impermeable conductive layer of graphite thereon.

b) Furthermore, both processes differ in the nature of the suspension and the way it is applied to the substrate.

As mentioned on page 2, second paragraph of the present application, the substrate - such as a metal foil, which is per se nonporous - is immersed into a suspension comprising graphite in an organic solvent, such as an alcohol (page 4, fourth paragraph).

In clear contrast to this, in Yamada et al.'s process the substrate - such as nickel foam, which is porous - is treated with a mixture of graphite particles and a carbon precursor, such as pitch, which is not a solvent (Examples 1 and 2). This is clearly not an immersion of a metal foil into a suspension of graphite in a solvent.

Alternatively, Yamada et al. suggest a solid-phase carbonization process, in which the substrate is treated with a polymeric material, such as polyvinylidene fluoride or the like (column 6, line 65 - column 7, line 7). However, as mentioned on column 8, lines 9 to 11, polyvinylidene fluoride is not a solvent, but a binder. This alternative therefore involves the application of a paste comprising graphite particles, polyvinylidene fluoride as binder and a solvent, such as N-methyl-2-pyrrolidone (Example 8). Also this alternative has nothing to do with immersion of a substrate into a suspension of graphite in a solvent. The same is true for the process disclosed in Comparative Example 1, which also makes use of a binder.

Considering the fact that at least two alternatives of the process disclosed by Yamada et al. differ from the process described in the present application in the way the graphite particles are applied onto the substrate, the Yamada et al. reference does not necessarily lead to electrodes with the same properties as that of the present invention.

c) Moreover, both processes differ in the temperature treatment after application of the graphite particles onto the substrate.

While according to the present application the substrate is first incubated at 80 to 150 °C and afterwards at a temperature between 200 and 450 °C, Yamada et al.'s process has a final sintering step at about 1,000 °C (column 9, line 54).

In contrast to the Examiner's statement, sintering will not necessarily lead to a substrate with an impermeable layer of graphite thereon. If a porous material, such as nickel foam as shown in Figure 2 of the reference, is used as substrate, and a highly viscous mixture of graphite particles and pitch, as in Examples 1 and 2, is applied to this substrate, the surface tension of the mixture prevents - as mentioned above - the graphite particles from entering significantly deep into the pores. Therefore, as mentioned on column 10, lines 30 to 34, they may only significantly enter the pores by diffusion. However, as one of ordinary skilled in the art knows, diffusion of a solid in pores is - even under elevated temperatures - a very time consuming process so that under the process conditions disclosed by Yamada et al. a coating of the whole pore-surfaces only by diffusion cannot be achieved. Furthermore, even diffusion will always lead to a concentration gradient with the larger concentration at the outer sides of the pores and the lower concentration at the inner side of the pores. Also due to the latter reason, a complete coverage of the inner pore surface will not be achieved.

Therefore, even if sintering per se leads to a more dense structure as stated by the Examiner, sintering in Yamada et al.'s process will not lead to the coverage of the inner pores surfaces with graphite particles since there are no particles at these areas.

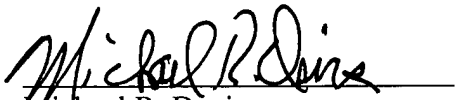
d) In summary, the process disclosed by Yamada et al. differs from that described in the present application in three major process steps. Thus, the processes are neither identical nor substantially identical nor equivalent nor even similar, as supported by the fact that the PTO granted a patent for the process itself.

Since Yamada et al.'s process does not necessarily lead to impermeable or substantially impermeable electrodes comprising a substrate with an impermeable or substantially impermeable conductive layer of graphite thereon, it does not anticipate the subject matter of the present invention.

For these reasons, Appellants maintain their position that the presently claimed invention is clearly patentable over the Yamada et al. reference.

Respectfully submitted,

Giovanni Pietro CHIAVAROTTI et al.

By: 

Michael R. Davis
Registration No.25,134
Attorney for Appellants

MRD/pth
Washington, D.C.
Telephone (202) 721-8200
Facsimile (202) 721-8250
November 7, 2003